

REMARKS

Claims 9-17 are presently pending in this Application and claim 13 is objected to due to the informalities identified therein while claims 8-14 are rejected, under 35 U.S.C. § 103, over Weiss '237 in view of Morikawa '081. The Applicant acknowledges and respectfully traverses the raised objection and the raised obviousness rejections in view of the above amendments and the following remarks.

First considering the objections to claim 13, this claim is amended herein above to address and correct the grounds for objection and the Applicant accordingly respectfully requests that the Examiner to reconsider and withdraw the objection to claim 13. It will be noted that the above discussed amendments are submitted solely to overcome the raised grounds for objection of claim 13 and do not add any new matter to the invention, the specification or the claims.

Turning now to the rejections of claims 8-14, under 35 U.S.C. 103, over the cited prior art, it must first be noted that the subject matter of independent claim 8 is canceled in favor of new independent claims 15-17 which are directed to and includes substantially the same recitations and limitations as claim 8, but reexpressed that claimed subject to more explicitly and clearly recite the present invention and define or the applied art. It will also be noted that claims 9-14 are correspondingly amended to now depend from new claim 15, rather than from claim 8, so that dependent claims 9-14 now incorporate all of the recitations and limitations of claim 15 by dependency therefrom. It must be noted, in this regard, that such claims amendments are entered solely to more explicitly and clearly recite the present invention and these amendments do not add any new matter to the invention, the specification or the claims.

Now considering the present invention as now recited in new claims 15-17, the present invention is directed to a vehicle having a vehicle body (2) and individual electric wheel drive trains that include at least a left drive wheel (4) and a right drive wheel (6). As recited, the left and right drive wheels (4, 6) are driven by corresponding right and left drive trains (26, 28, 12; 34, 36, 14) that include corresponding right and left electric prime movers (16, 18) wherein the right and the left electric prime movers (16, 18) are each located radially outward from the corresponding drive wheel (4, 6) and at least partly in a plane of rotation of the corresponding drive wheel (4, 6). The right and the left drive trains (26, 28, 12; 34, 36, 14) and the prime movers (16, 18) are rigidly mounted to the vehicle body (20) and each drive wheel (4, 6) is connected to the corresponding drive train (26, 28, 12; 34, 36, 14) by a corresponding output transmission shaft (8, 10) accommodating a sprung suspension between the drive wheels (4,6)

and the vehicle body (2). The drive trains (26, 28, 12; 34, 36, 14) further include a shiftable clutch (32) for selectably interconnecting the right and the left drive trains (26, 28, 12; 34, 36, 14) so that each of the left and the right drive trains (26, 28, 12; 34, 36, 14) can be selectably driven by at least one of the right and the left prime movers (16, 18).

Turning now to the teachings of Weiss '237, this reference relates to an electric wheel drive for a vehicle, such as a farm tractor, in which each wheel is driven by an electric motor and a gear drive train. Weiss '237 explicitly teaches and shows that the electric motor and the gear drive train, for each wheel, are to be located generally coaxially and generally concentrically with the wheel shaft and to the inside of the wheel so that each electric motor and gear train is located within the radius of the wheel. That is, within the circumference of the wheel, and between the wheel and the centerline of the vehicle.

It is therefore apparent that there are a number of fundamental differences and distinctions between the present invention, as recited in new claims 15-17, and the teachings of Weiss '237. For example, according to the presently claimed invention, the electric prime movers (16, 18) are each located radially outward from the corresponding drive wheel (4, 6) and at least partly in a plane of rotation of the corresponding drive wheel (4, 6), thereby freeing up substantial payload space within the vehicle body.

According to Weiss '237, however, and in complete contrast from the presently claimed invention and, in fact, in direct contradiction to the present invention, each electric motor is located within the radius of the corresponding wheel and between the wheel and the interior space of the vehicle, thereby taking up the valuable payload space that is explicitly freed by the present invention.

In further fundamental distinction between the present invention and Weiss '237, the right and the left drive trains (26, 28, 12; 34, 36, 14) and the prime movers (16, 18) of the presently claimed invention are rigidly mounted to the vehicle body (20) while each drive wheel (4, 6) is connected to the corresponding drive train (26, 28, 12; 34, 36, 14) by a corresponding output transmission shaft (8, 10) that accommodates a sprung suspension between the drive wheels (4,6) and the vehicle body (2). According to the present invention, therefore, the prime movers and the drive trains are supported by the sprung suspension, thereby reducing the unsprung weight of the vehicle to essentially the drive wheels themselves.

According to Weiss '237, however, and in distinct contrast from the present invention, the electric motors and the gear drive trains are shown as being mounted directly on and supported by the axles of the wheels, so that according to the Weiss '237 arrangement, the

electric motors and the drive trains are unsprung weight which is in direct contradiction to the presently claimed invention.

It is therefore the Applicant's belief and position that the present invention, as recited in independent claims 15-17, as well as claims 9-14 dependent from claim 15, is completely and patentably distinguished over and from the teachings of Weiss '237 under the requirements and provisions of either 35 U.S.C. 102 and/or 103. As such, the raised rejection in view of that reference should be withdrawn at this time.

Next considering the teachings of Morikawa '081, this reference relates to an electrical drive mechanism for a vehicle that includes, in a single casing, one or two electric motors and a single or a dual planetary reduction gearset that are arranged concentrically and coaxially around right and left drive shafts two right and left wheels.

In complete contrast from and contradiction to the presently claimed invention, therefore, and in the same arrangement as taught by Weiss '237, the assembly, including the casing, the motor or the motors and the single or the dual planetary reduction gearsets, are located coaxially with and within the circumferences of the wheels and are entirely located between the wheels, that is, in the center of the vehicle. The arrangement specifically taught by Morikawa '081—like the arrangement taught by Weiss '237—thereby takes up the valuable payload space within the vehicle that is explicitly freed by the presently claimed invention.

It must also be noted that, in further fundamental contrast between the present invention and Morikawa '081, the drive trains of the present invention include a shiftable clutch for selectably interconnecting the right and the left drive trains with one another so that each drive train can be selectably driven by at least one of the right and the left prime movers. In contrast from the present invention, the arrangements taught by Morikawa '081 either include a single motor for both wheels or two motors coupled to the wheels through a single, dual sided planetary gear set. None of the implementations specifically taught by Morikawa '081, however, include any type of clutch arrangement whereby each drive train can be selectably driven by one or the other, or both, of the right and the left prime movers, as presently recited.

It is therefore the Applicant's belief and position that the present invention, as recited in new independent claims 15-17, as well as claims 9-14 dependent from claim 15, is completely and patentably distinguished over and from the teachings of Morikawa '081 under the requirements and provisions of either 35 U.S.C. 102 and/or 103. As such, the raised rejection in view of of Morikawa '081 should be withdrawn at this time.

Lastly turning now to the combination of Weiss '237 and Morikawa '081, it is apparent that any combination of Weiss '237 and Morikawa '081 will result in an assembly wherein the entire assembly, including any casings or the mounts, the motor or motors and the drive train or drive trains will be located coaxially with and within the circumferences of the wheels and will be entirely located between the wheels, that is, in the center of the vehicle, so that the arrangement will take up the valuable payload space in the vehicle that is explicitly freed by the presently claimed invention.

It is respectfully submitted that the teachings of Weiss '237 and Morikawa '081 are incompatible in certain fundamental aspects, so that the combination would be fundamentally at least unlikely or more probably unworkable. More specifically, the Weiss '237 mechanism employs a clutch between the electric motors and drive trains of opposing wheels so that each wheel can be selectably driven by one or the other or both of the electric motors. While the second Morikawa '081 mechanism employs two electric motors, the two electric motors are coupled to the two wheels through a single dual planetary gear set so that both motors effectively drive the output shafts to the two wheels, which is completely incompatible with the Weiss '237 mechanism.

The combination of Morikawa '081 with Weiss '237 would thereby require either eliminating the clutch mechanism taught by Weiss '237 in favor of the planetary gear arrangement taught by Morikawa '081, so that the result would again be distinguished from the present invention for the reasons discussed above, or somehow adding a Weiss '237 type clutch mechanism to the Morikawa '081 mechanism. The second approach, adding a Weiss '237 clutch to the Morikawa '081 mechanism would, however, essentially require also replacing the planetary gear set with another gear mechanism to accommodate the clutch mechanism, which would be very unlikely and impractical and would negate the advantage of the Weiss '237 and Morikawa '081 mechanism, which is a compact construction.

It is therefore the Applicant's belief and position that there is no proper combination of Weiss '237 in view of Morikawa '081 that would teach, suggest or disclose the present invention, as recited in new claims 15-17, under the requirements and provisions of 35 U.S.C. 103 and that the presently claimed invention is completely and patentably distinguished over and from the teachings of Weiss '237 and Morikawa '081 under the requirements and provisions of both 35 U.S.C. 102 and 35 U.S.C. 103. The Applicant therefore respectfully requests that the Examiner reconsider and withdraw all rejections of the pending claims, in view of Weiss '237 and/or Morikawa '081, and allow claims 9-17 as presented herein above.


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In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejection(s) should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejection(s) or applicability of the Weiss `237 and/or Morikawa `081 references, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,


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